What is OSPF routing protocol ?

* **Open shortest path first**
* **Layer 3 protocol**
* **Dijkstra algorithm**
* **Protocol no 89**

**What is multicast address?**

**Multicast address it has two multicast address**

* **224.0.0.5 (all router ‘s multicast address )**
* **224.0.0.6( DR and BDR router)**

**Mention some characteristics of OSPF?**

* **AD value -110**
* **Unlimited hop count**
* **Metric of OSPF =cost**

**How to calculate cost = Reference b/w**

**Link b/w**

**B/w in mbps**

**What is OSPF concept area ‘s ?**

* **Range of area 0-65535**
* **Area 0 is backbone area**
* **All other area’s are standard area ‘s**
* **All the area must be connected to the area 0**
* **Small database size**

**What are types router in OSPF ?**

* **Backbone router – a router which has all interface in Backbone area’s**
* **Internal router – a router which has all interface in standard area’s**
* **ABR( area border router) – a router which connect two or more area**

**NOTE- ABR must have at least 1interface in back bone area**

* **ASBR- autonomous system boundary router if redistribution is prefer then router are ASBR.**

**What is neighbourship condition?**

* **Router id must be unique**
* **Area id must match**
* **Timer must match**
* **MTU must match**

**Router ID –IT is the unique identification of device in OSPF.**

**How to elect router id ?**

**Two methods for elect router id**

* **Manually**
* **If router id is not assigned manually then router ‘s elect router id dynamically**
* **Highest ip address of loopback interface**
* **If router does not have any loopback interface then highest ip address of physical interface**
* **OSPF Timer**
* **1- Hello time =10 sec**
* **2- Dead time = 40 sec**

**What is process ID?**

**The OSPF process-ID is a numeric value .**

**A router can have 1 or multiple process ID but a single interface can being only to a single process. It is not a neccessory to match process id on two neighbour router.**

**What is OSPF packet?**

* **Hello packet – this packet is used to discover neighbour ‘s. after discovery this packet is used to maintain the neighbour.. this packet generate every 10 sec**
* **DBD( database description) – router ‘s never sent full database neighbour ship .router’s forward summary of database using DBD packet.**
* **LSR (link state Request)- router ‘s never sent full database and find the missing piece of information then router generate LSR to get the complete information of missing database..**
* **LSU (link state update )- in this packet router provide complete database as requested**
* **LS –ack (link state ack)- router receive link state update and generates LS ack in reponse.**

**What are state of OSPF?**

* **Down**
* **Init**
* **Two way**
* **Ex start**
* **Exchange**
* **Loading**
* **full**

**down- no hello packet has been received on the interface .or if something is misconfigured**

**INit- router has received a hello message from the other OSPF router**

**Two way – hello packet is received a hello message send of the own .bidirectional communication has been establish.**

**R-ID is present inside hello packet**

**EX start – In this state router exchange blank ( empty DBD ). In this MTU{maximum transmission unit }is compared .also preform master and slave election in this state**

**By default both announce themselves as master in the blank DBD. after comparison a router with highest router id elected as master**

**DR and BDR establish adjacencies with each router with highest router id elected as master**

* **DR and BDR establish adjacencies with each router in the network**

**Exchange- in this state router ‘s send the summary of database ( DBD)**

**Loading –LSR are send to neighbour for every network it doesn’t know about .the neighbour replies with LSU which contain info about requested network .and when neighbour receive LSU reply LS ack**

**FULL- in this state router ‘s are adjancent**

**Types of LSA (Link state advertisement) in ospf**

* **Router LSA ( type 1 ) – each router generate a type 1 LSA that lists its active interface , ip address , neighbour and the cost .LSA type 1 is flooded only within area**
* **Network LSA (type 2)- type 2LSA is sent out by the designated router (DR) and lists all the router on the segment it is adjacent to. Type 2 LSA are flooded only within an area**
* **Summary LSA (type 3)- type 3 LSA generated by area border router (ABR) to advertise network from one to another in Autonomous System**
* **Summary ASBR LSA( type 4) – type 4 LSA are generated by area ( ABR) .it contain information to reach ASBR**
* **External LSA (type 5) –external LSA are generated by ASBR and contain routes to network that are external to the current autonomous system**

**What are type ospf network**

* **Point to point**
* **Stub**
* **Broadcast**

**Broadcast network – the broadcast type is default for an ospf enabled Ethernet interface**

**Challenges with broadcast network**

* **No of neighbour**
* **Database exchange**

**How to solve the broadcast network challenges ?**

**DR and BDR on broadcast network**

**Designated router- OSPF elect 1 router per network as DR**

**Backup designated router – ospf elect 1 router per network as BDR**

**DR other- all the remaining router in each network are known as DR – other router**

**Criteria of DR and BDR election**

* **Highest priority**

**By default priority =1**

**Range of priority =0-255**

**NOTE- if priority is configure 0 of Ethernet interface .then router does not participate in DR and BDR election**

* **Highest router id**

**Ospf hello time 10 sec**

**Wait time = 40 sec**

**OSPF command**

**#show ipOSPF databse**

**#show ip OSPF**

**#show ipintbri**

**#show ip route**

**#show ip OSPF neighbour**

**R1#config router ospf 1**

**R1#network 10.0.0.0 255.0.0.0 area 0**

**R1#exit**